

August 24, 2006

Memorandum

Subject: Response to Comments Received on Draft Screening-Level Risk Assessment for Recreational Use of Beaches Upper Columbia River, Dated: July, 2006

From: Marc Stifelman, Office of Environmental Assessment

To: Sally Thomas, Office of Environmental Cleanup
Kevin Rochlin, Office of Environmental Cleanup
Randal Connolly, Spokane Tribe of Indians
John Roland, Washington State Department of Ecology
Gary Passmore, Confederated Tribes of the Colville Reservation
Dan Audet, U.S. Fish and Wildlife Service

Cc: EPA UCR Team, including:
Bruce Duncan, Office of Environmental Assessment
Burt Shephard, Office of Environmental Assessment
David W. Charters, Emergency Response Team

Thank you for taking the time to review and comment on this draft. Comments received on the Draft Screen Risk Assessment addressed the following concerns:

- 1) Appendix A will be corrected.
- 2) Emphasize the limitations of recreational land-use assumptions to address more intense residential or tribal land use

This will be reiterated in the text.

- 3) Emphasize additional risk scenarios planned in Human Health Risk Assessment

This will be reiterated in the text.

- 4) Uranium non-detect data gap

The inadequacy of the uranium data is identified as a data gap.

- 5) Background data gap

Additional background data may need to be collected during the RI/FS investigations. However, selection of 3 mg/kg as a background level of arsenic is likely protective because it is lower than MTCA studies or values used by USGS (Majewski, Kahle, Ebbert & Josberger, 2003; Washington State Department of Ecology, 1994).

6) Request for more precise location maps

Given the screening objective of the assessment and the limited sampling coverage, we feel that more precise maps may convey a level of precision and knowledge which exceeds our current understanding of the site. We believe this will be more appropriate as subsequent Phases of the RI/FS are completed.

7) Using 10-15 cm sample depth to represent exposures like to be concentrated towards the surface.

Although, the screening assessment is limited to samples collected from the upper 10-15 cm in April of 2005, USGS collected a similar number of samples (from similar locations) from the upper 2-3 cm in April – May of 2001 (Majewski, Kahle, Ebbert & Josberger, 2003). Examination of the USGS results provides reassurance that exposures were not underestimated based on sample depth or particle size (USGS analyzed the < 63 μm size fractions). Despite collecting a shallower sample and analyzing a smaller size fraction, the concentrations reported by USGS were less than EPA results. Based on the 18 spatially distributed samples and six transects, only 2 samples exceeded the arsenic screening PRG. For example, the two highest samples were 17 and 19 mg/kg compared to the arsenic PRG of 16 mg/kg. None of the USGS samples exceeded the lead PRG of 400 mg/kg.

8) Implications of sediment sample particle size

The effect of particle size on contaminant concentration was examined to a limited extent using a 75 μm cut-off at the following three beaches: Columbia Campground at River Mile 642, Kettle Falls at River Mile 700, and Northport at River Mile 735. At Columbia Campground and Kettle falls, concentrations of the COPC metals were higher in the finer size fraction (silt/clay), but this pattern was reversed at Northport where metal concentrations were greater in the fine sand fraction for the seven metals assessed. This pattern is consistent with the conclusions of the Sediment Data Evaluation Report which observed that metals associated with slag commonly occur in the sand size fraction, especially in reaches upstream from Marcus Flats (U.S. Environmental Protection Agency Region 10, 2006). The attached table illustrates this pattern. Additionally, sediment samples analyzed by USGS used a 63 μm sieve, but did not exceed un-sieved samples analyzed by EPA (Majewski, Kahle, Ebbert & Josberger, 2003).

With regards to dermal adherence, although smaller *soil* particles generally have greater dermal adherence than larger particles, moisture in river sediment will enhance adherence of larger particles (Kissel, Richter & Fenske, 1996). We have observed tenacious adherence of substrate from “Black Sand” beach, during our site visits.

9) Reference to ratio of maximum to average

At 12 of the 15 beaches, samples were limited to three composites of nine sub-samples. The ratio of maximum to average was selected as an appropriate descriptor because it relates our exposure point concentration (the sample maximum) to the most likely estimate of the true concentration (the sample average) while also providing a crude and unbiased measure of spread in the data. Although I had calculated standard deviations and coefficients of variation, I did not think it was appropriate to present these parameters for such a small dataset. I am receptive to alternative descriptors appropriate for N of 3 data.

10) Use of “homogenous” description of sample concentrations.

Use of the term “homogenous” will be replaced with less subjective descriptions of data spread based on ratios of observed concentrations.

Comparison of COPC Metals Concentrations in Silt and Clay Versus Fine Sand Fractions

Total Metals < 75 µm Clay and Silt Fractions

Sample	Location	Antimony	Arsenic	Copper		Iron	Lead	Manganese	Uranium
RM642BSF	Columbia Campground	6.1 UR	3.9	24	J	21,000	47	389	20 UJ
RM700BSF	Kettle Falls	6.0 UR	2.0	27	J	24,600	22	568	20 UJ
RM735BSF	Northport	3.9 J	10	278	J	35,100	325	690	19 UJ

Total Metals > 75 µm Fine Sand Fraction

Sample	Location	Antimony	Arsenic	Copper		Iron	Lead	Manganese	Uranium
RM642BSF	Columbia Campground	4.7 UR	2.6	9.8	J	14,100	26	187	16 UJ
RM700BSF	Kettle Falls	4.9 UR	1.2	12	J	12,800	7.5	211	16 UJ
RM735BSF	Northport	47 J	10	1,530	J	126,000 D	267	2,380	19 UJ

Ratios of > 75 µm (Fine Sand) to < 75 µm (Clay and Silt)

Sample	Location								
RM642BSF	Columbia Campground	77%	67%	41%		67%	55%	48%	76%
RM700BSF	Kettle Falls	82%	60%	45%		52%	34%	37%	82%
RM735BSF	Northport	1215%	97%	550%		359%	82%	345%	98%

References Cited

- Kissel, J.C., Richter, K.Y. & Fenske, R.A. (1996). Factors affecting soil adherence to skin in hand-press trials. *Bull Environ Contam Toxicol*, **56**, 722-8.
- Majewski, M.S., Kahle, S.C., Ebbert, J.C. & Josberger, E.G. (2003). Concentrations and Distribution of Slag-Related Trace Elements and Mercury in Fine-Grained Beach and Bed Sediments of Lake Roosevelt, Washington, April-May 2001 pp. 29. U.S. Geological Survey: Tacoma, WA.
<http://water.usgs.gov/pubs/wri/wri034170/>.
- U.S. Environmental Protection Agency Region 10. (2006). Draft: Phase I Sediment Sampling Data Evaluation - Upper Columbia River Site RI/FS pp. 330 plus figures. Prepared by CH2MHill: Seattle, WA.
- Washington State Department of Ecology. (1994). Natural background soil metals concentrations in Washington State. <http://www.ecy.wa.gov/pubs/94115.pdf>.